SERIES 63R
High Resolution, Ball Bearing,
5-pin (Polarized Connection)

FEATURES
• 25, 32, 50, 64, 100, 128 and 256 Cycles per Revolution Available
• Sealed Version Available
• Rugged Construction
• Cable or Pin Versions
• 300 Million Rotational Cycles
• 5000 RPM Shaft Rotation
• Index Pulse Available

DIMENSIONS

UNLESS OTHERWISE SPECIFIED, DIMENSION TOLERANCES ARE AS FOLLOWS
LINEAR 0.010 (.25), DIAMETERS 0.010 (.25), ANGULAR 5˚
**CIRCUITRY AND WAVEFORM:** Standard Quadrature 2-Bit Code

![Diagram of Circuitry and Waveform]

**SPECIFICATIONS**

**Electrical Ratings**
- Operating Voltage: 5 ± 25 Vdc
- Supply Current: 30 mA maximum at 5 Vdc

**Logic Output Characteristics:**
- Schmitt Trigger and 10 KW pull-up resistor
- Power Consumption: 150 mW maximum
- Optical Rise Time: 500 nS typical
- Optical Fall Time: 14 nS typical

**Mechanical Ratings**
- Mechanical Life: 300 million revolutions
- Time Life: Guaranteed for 10 years of continuous operation (calculated from emitter degradation data)
- Mounting Torque: 20 in-lbs maximum
- Terminal Strength: 5 lbs terminal pull-out force minimum
- Solderability: 95% free of pin holes and voids
- Externally Applied Shaft Force:
  - Axial: 15 lbs maximum; Radial: 15 lbs maximum
- Operating Torque: 0.5 in-oz maximum (no detents) for unsealed versions

**Environmental Ratings**
- Operating Temperature Range: -40°C to 85°C
- Storage Temperature Range: -55°C to 100°C
- Relative Humidity: 90-95% at 40°C for 96 hours
- Vibration Resistance: Harmonic motion with amplitude of 15g, within a varied 10 to 2000 Hz frequency for 12 hours per MIL-STD-202, Method 204
- Shock Resistance: Test 1: 100g for 6 mS, half-sine wave with velocity change of 12.3 ft/s. Test 2: 100g for 6 mS, sawtooth wave with velocity change of 9.7 ft/s.

**Materials and Finishes**
- Bushing: Zinc diecast
- Housing: Zytel FR-50
- Shaft: Stainless steel insert molded into nylon rotor support
- Code Rotor and Aperture: Chemically etched stainless steel/electroformed nickel
- Printed Circuit Board: NEMA Grade FR-4.
- Five microinches minimum gold over 100 microinches minimum nickel over copper
- Optical Barrier: Polyphenylene sulfide, 94 V-0

**Backplate:** Polyester
- **Header:** Phosphor bronze, 200 microinches tin over 50 microinches nickel (pin version only)
- **Infrared Emitter:** Gallium aluminum arsenide
- **Photo IC:** Planar silicon
- **Retaining Ring:** Stainless steel
- **Cable:** 26 AWG, stranded/tinned wire, PVC coated on .100 (2.54) centers (cable version only)
- **Connector:** Glass-filled PCT, UL94V-0

**Bearing Subassembly**
- **Bearing:** NSK ABEC 5 (stainless steel)
- **Preload Collar:** 303 stainless steel
- **Spacer:** 303 stainless steel
- **Bellville Spring:** spring steel (stainless)

**ORDERING INFORMATION**

- **Series**
- **Style:** R = Standard, 5-pin, high resolution
- **RS** = Sealed, 5-pin, high resolution
- **Cycles:** per channel per revolution = 25, 32, 50, 64, 100, 128, 256

**Termination:**
- Blank (no dash or numbers): pins as described in drawing.
- **Cable Termination:** 060 = 6.0in. Cable is terminated with Molex Connector P/N 14-56-3056

**Available from your local Grayhill Distributor.** For prices and discounts, contact a local Sales Office, an authorized local Distributor or Grayhill.